

The Inland Fisheries News

Newsletter of the Central Inland Capture Fisheries Research Institute

Volume 1

January - June 1996

Number 1

Dr. M. Sinha, the New Director of CIFRI



Dr. Maniranjana Sinha, has taken over as the Director, Central Inland Capture Fisheries Research Institute on 26 March 1996. Born on 2 April 1942, Dr. Sinha had his early education at Gorakhpur and Allahabad Universities from where he obtained Master's Degree in Zoology and Fish and Fisheries in 1961 and proficiency Certificate in French in 1970. In 1961, he joined CIFRI where he built his distinguished career in inland fisheries spanning 35 years. Dr. Sinha is widely recognised as an expert in riverine and estuarine fisheries.

Dr. Sinha started his career in the Freshwater Fish Culture Division at Cuttack and then moved over to the Riverine Division of CIFRI at Allahabad and participated in the pioneering research effort of the Institute in riverine spawn prospecting and fishery biology. He has also served the National Bureau of Fish Genetic Resources and the North Eastern Council, Shillong. As Fisheries Adviser to NEC, Dr. Sinha spearheaded the fisheries development activities of the region from 1988 to 1992.

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Pen Culture of prawns in the beels of West Bengal

A pen culture technology has been developed by the Central Inland Capture Fisheries Research Institute which is suitable for large-scale adoption in the *beels* of West Bengal. The freshwater prawn, *Macrobrachium rosenbergii* was successfully cultured in pens erected in the Akaipur *beel*, West Bengal. The prawn grew from 4 g to 90 g (av.) during a culture period of less than 90 days. Remarkable features of the pen culture system in *beels* are the low input cost and high yield.

The *beels* or the floodplain lakes are a common feature of the landscapes of rural West Bengal, Assam and Bihar. These water bodies are essentially the cutoff river meanders, with or without a connection with the parent river. Apart from being an important source of fisheries, *beels* form the lifeline of these States supporting agriculture, post harvest operations and navigation.

Experiments have been conducted

in the Akaipur *beel* of West Bengal to culture the giant freshwater prawn, *Macrobrachium rosenbergii* in pens.

The CIFRI technology is simple and inexpensive. The pen material is prepared from bamboo, which is locally available in plenty. Split bamboos are woven together with coir ropes. The split bamboo mats are erected in the *beel* and they are covered with close meshed nylon cloth. The bamboo screens are further reinforced with



RESEARCH HIGHLIGHTS

At CIFRI, he has held many important positions in Estuarine Fisheries, Extension, Operational Research Project and Beel Fisheries Divisions. As Coordinator Beel Fisheries during 1986-87, Dr. Sinha was responsible for planning guidance and execution of all research projects related to floodplain lakes at CIFRI. He also has experience in fish culture and breeding for a protracted period of 13 years.

Dr. Sinha was instrumental in formulation and guidance of all research project programmes of the Division covering Hooghly-Matlah and Narmada estuarine systems. He provided able leadership to the trail blazing research on biology, production dynamics and migratory habits of hilsa on account of which the country is now poised for formulating strategies for recovering the lost hilsa fisheries of the Ganga.

Dr. Sinha has acted as member of State Fisheries Planning Committees of seven northeastern states of the country and programme Co-Director of short-term training programmes for fisheries officials of north-eastern states. He is examiner of Graduate, Post Graduate, M. Phil. and Ph. D. programmes of various universities.

Dr. Sinha is a member of Asian Fisheries Society and a life member of its Indian Chapter. He has been conferred the Honorary Fellowship of the Inland Fisheries Society of India in 1994. An important landmark in his career is the *Kheti puraskar* of the Indian Council of Agriculture Research, which was awarded to him for the biennium 1986-87. Dr. Sinha has published 31 research papers in national and international journals, apart from numerous book chapters, bulletins, popular articles and extension pamphlets.

By assuming the stewardship of CIFRI from Dr. V.R.P Sinha, the acting Director of CIFRI on 29.3.1996 Dr. Sinha has joined the galaxy of distinguished scientists such as Dr B.S. Bhimachar, Dr. V.G. Jhingran, Dr. A.V. Natarajan, Dr. A.G. Jhingran and Dr. S.P. Ayyar.

Prevent capture of young fish and prawn

New lights on the population of hilsa

The Indian shad, *Tenualosa ilisha* (Ham), is important anadromous fish ascending the river Hooghly and constituting an important fishery in the estuarine stretch of the river. Recent studies conducted by the Central Inland Capture Fisheries Research Institute throw new light on the spawning pattern of the fish and its seed distribution in different centres of the estuary. Some perceptible changes are discernible in the distribution of the fish's breeding ground within the estuarine zone. It has become evident from the studies that the area of distribution of hilsa seed in the estuary during post-Farakka barrage period has increased in comparison to pre-Farakka barrage period. This change is largely attributed to the increased discharge of freshwater into the estuary during the post-Farakka period. The higher rate of freshwater discharge through the barrage has significantly reduced the salinity

downstream, converting earlier gradient zone into an almost freshwater one, a condition more conducive for spawning of hilsa. The spawn appears in the freshwater zones of the estuary mainly from October and it continues up to May or June. The freshwater stretch of the estuary also acts as nursery ground for the hilsa spawn. The studies also revealed a faster growth rate of juvenile hilsa during the post-Farakka barrage period, compared to the pre-Farakka period.

Before the Farakka barrage was constructed, hilsa was not known to ascend the estuaries other than Hooghly. Now adult hilsa is available in plenty in Thakuran and Matlah estuaries, particularly during monsoon months (July to September). Range of upward migration of hilsa extends to Moipeeth. Hilsa fry in the size range of 40 - 90 mm is also recorded in most of the estuaries of Sundarbans conducive for spawning of hilsa. Thus, the freshwater discharge from Hooghly has changed the salinity pattern of all the estuaries of Sundarbans.



Pen culture.....

From Page 1

galvanized iron mesh for protection against crabs.

The pens were stocked with prawn juveniles of 75 to 80 mm size (4 g) at a stocking density of 12,000 prawns per ha. The prawns, harvested after a grow out period of 89 days, were found to grow up to 230 mm length and 160 g in weight, the averages being 190 mm and 86 g respectively.

Lime was applied in the pen water as a prophylactic measure against diseases. A locally manufactured feed was given to prawns to supplement the natural feed available in the pen. The artificial feed made of prawn meal, contained 23% protein. Feeding was done during night @ 3-4% body weight. The experiments are being continued. Preliminary results indicate that the feeding rate can be reduced further and a higher stocking density is possible. Stocking density, feeding rate and the species mix are being standardised.

RESEARCH HIGHLIGHTS

Extension of mangrove species beyond intertidal zone

The Central Inland Capture Fisheries Research Institute, under its National Fellowship Scheme, has started a major initiative to save the Sundari tree from extinction. *Heritiera fomes* Buch Ham., the Sundari tree has become very rare and is considered as a threatened species of the Indian Sundarbans. The main cause for its depletion is the changed environmental conditions, like abstraction of upstream freshwater supply to this Sundarbans mangals, due to neotectonic movement of the flow of the River Ganga towards east and the rapid premature or over exploitation of this tree for its strong, durable timber. Propagation of *Heritiera fomes* suffers setback due to lack of its spontaneous natural regeneration and growth in these changed intertidal mangals of the Sundarbans, West Bengal.

Attempts have been made by Central Inland Capture Fisheries Research Institute to collect the viable seeds of *Heritiera fomes* from the Sundarbans tidal water during monsoon months and germinate their seedlings in the laboratory of the CIFRI station. Several of these seedlings were initially distributed to different interested persons and organizations. This initial attempts for plantation of this species have given highly encouraging results on its growth and development pattern in the non-saline zones beyond the tidal interaction zone. The plant has registered a growth of 4 m height within 2 years.

After these sporadic field trials, a concerted attempt was made to introduce and plant this important mangrove species beyond the intertidal zones at the Central Park (Bano Bitan), Salt Lake. Apart from beautifying this important park, the campaign is expected to help popularising the tree among the common people and create awareness about the importance leading to the conservation of this threatened species.

On 10th May, 1996, the campaign to popularise the plant was inaugurated by Shri G.S. Mondal, Principal Chief Conservator of Forest, Govt. of West Bengal, at a function attended by Dr. M. Sinha, Director, CIFRI, Shri J.N. Bhadury, Chief Conservator of Forest & Director, Sundarban Biosphere Reserve, and others.

Population dynamics of *Pama pama*

Population dynamics of commercially important fish species is an important component of the Research Project Programme of the Resource Assessment Division. The length-frequency distribution of *Pama pama* collected from Hooghly-Matlah Estuarine system were subjected to critical analysis. Based on this and the growth parameters estimated earlier, mortality rates of the fish were worked out. The total mortality rate was found to be $Z = 10.70$ with fishing mortality rate at $F = 8.584$. The present exploitation rate of 0.80 was found to be higher than the exploitation rate (0.77) during 1987-89. Fishing intensity went up by 3.9%. The increase in catch was 5.6% compared to 1987-89.

The increase in catch and recruitment was due to extension in the area of exploitation employing more motorised boats. The recruitment to the fishing grounds increased by 7%.

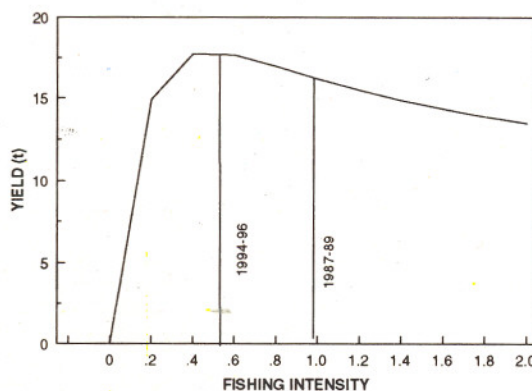


However, the mean length recorded as 16.22 cm in 1987-89 decreased to 16.03 cm in 1994-96 indicating over exploitation. There is a need to reduce fishing pressure by 64% from the existing level in order to maintain a sustainable yield.

Revival of *L. Parsia* catch in the Hooghly-Matlah Estuarine System due to change in the effort pattern

The monthly length-frequency data collected from the Hooghly-Matlah Estuarine System were subjected to critical analysis for studies on population dynamics. The fishing mortality was worked out as $Z = 2.81$ for *L. parsia*. It was observed that the fishing mortality has considerably gone down compared to 1987-89 when the fishing mortality was $z = 4.91$. As expected, the reduction in fishing intensity resulted in an increase in the fish catch from 14.72 tonnes to 19.23 tonnes, an increase of 31%.

Similar reduction in fishing mortality was found in *P. paradiseus* ($F = 4.49$) during 1994-96 compared to the period 1987-89 when the fishing mortality ($F = 6.00$) was almost at its optimum level for providing sustainable yield. But, due to the reduction in fishing pressure, there was reduction in fish catch from 180.97 tonnes during 1987-89 to 150.33 tonnes during 1994-96, a decrease of about 17%.



Thompson and Bell longterm forecast for *L.parsia*

During recent years, a change has been observed in the fishing pattern. More motorised boats are being operated in the mouth of the estuary covering wider area extending even upto the sea. As a result, the fishing pressure on these two species which are available near the coastal region of the estuary is less. This is quite obvious since increase of fishing intensity has rendered the fishery to an uneconomical level and fishing area has been shifted towards the sea.

Research Advisory Committee

The second meeting of CIFRI Research Advisory Committee was held at Barrackpore on 29th and 30th July 1996 which was attended by the following members :

1. Dr. K.V. Devaraj, Chairman
2. Dr. N.C. Dutta, Member
3. Dr. V. Vats, Member
4. Dr. Brij Gopal, Member
5. Dr. E.J. James, Member
6. Dr. A.R. Khudabuksh, Member
7. Dr. M.Y. Kamal, Member
8. Dr. M. Sinha, Member
9. Dr. K.K. Vass, Member Secretary

Apart from RAC members, six Heads of Division, other project leaders and scientists stationed at Barrackpore and Calcutta also participated in the meeting. The Session on 29th July 1996 was exclusively devoted to the discussions on various project programmes being pursued under various divisions and the sponsored/consultancy projects. The Research Advisory Committee members were informed about the progress achieved through presentations made by different Heads of Division and Project leaders. The suggestions made by different members were noted by the respective Project leaders for incorporation in their technical programmes. The meeting on 30th July 1996 focused on the Institute's Perspective Plan. The Chairman and members appreciated the efforts put in by the Director and scientists of the Institute for preparing a balanced and well thought out Perspective Plan. It was approved by the RAC members after suggesting some modifications.



Top: Research Advisory Committee in Session

Bottom: Dr. K. V. Devaraj, Chairman, RAC and Dr. M. Sinha, Director CIFRI at the RAC Meeting

On the anvil -1

Rapid survey of river systems

Riverine environment in India is subjected to the worst form of environmental degradation due to man-made changes such as excessive sedimentation, water abstraction, river training, and discharge of domestic, industrial and agricultural wastes into the river water. Off-channel activities like deforestation and catchment modification can also lead to soil erosion which affects the riverine ecosystem adversely. All these perturbations cause destabilization of the fragile ecosystem and loss of its natural biological wealth.

With a view to assessing the possible ill effects of environmental changes on the riverine ecosystems in general and their fish yield in particular, a survey has been initiated by the Institute covering the major river systems of the country like the Ganga, Brahmaputra, Mahanadi, and Narmada. The study aims at a reappraisal of the ecology and fisheries of the rivers and recording of the changes that have taken place during the last few decades and their possible impacts.

**Give someone fish- He has food for the day
Teach him how to fish- He has food for the rest of his life**

SRC Meeting

The Staff Research Council meeting of the Institute was held at CIFRI Auditorium, Barrackpore on 27 and 28 May 1996. Dr. M. Sinha, Director, chaired the proceedings and Dr. M. Y. Kamal, Assistant Director General (Inland Fishery), Indian Council of Agriculture Research was present on the occasion. The SRC meeting reviewed the progress made under the 19 regular research projects in the light of their technical programme. A thorough review of the ongoing technical programme of the research projects of the Institute was made. Some policy decisions were taken regarding administrative and technical overhauling of the existing seven Divisions of the Institute. The Project Programme for the year 1996-97 was finalised at the meeting in the light of the discussions and within the framework of guidelines given by the Research Advisory Committee of the Institute.

EXTENSION SCENE

Awareness campaign about collection of fish and prawn seed from the wild

One of the most undesirable consequences of the recent shrimp culture boom is the collection of natural prawn seed. The rate of natural seed collection has reached alarming proportions causing equal anxiety among environmentalists as well as fishery scientists. Lured by the regular income in cash, poor people of Sunderbans resort to collection of fish and shrimp seed, little realising the ecological damage the activity can cause. While the seed collectors catch the young ones of a number of fish and prawn species, only the culturable seed is retained and the rest discarded. This way millions of valuable organisms are destroyed during the process of natural seed collection, adversely affecting the recruitment of stocks in freshwater and marine ecosystems. There is also a serious threat to the biodiversity of the region.

A mass awareness campaign was launched by CIFRI to drive home the concept of biodiversity conservation and sustainable development among the rural populace. The programme, launched with the active cooperation of the NGOs, included training programmes, fish farmers' days, distribution of literature, etc.

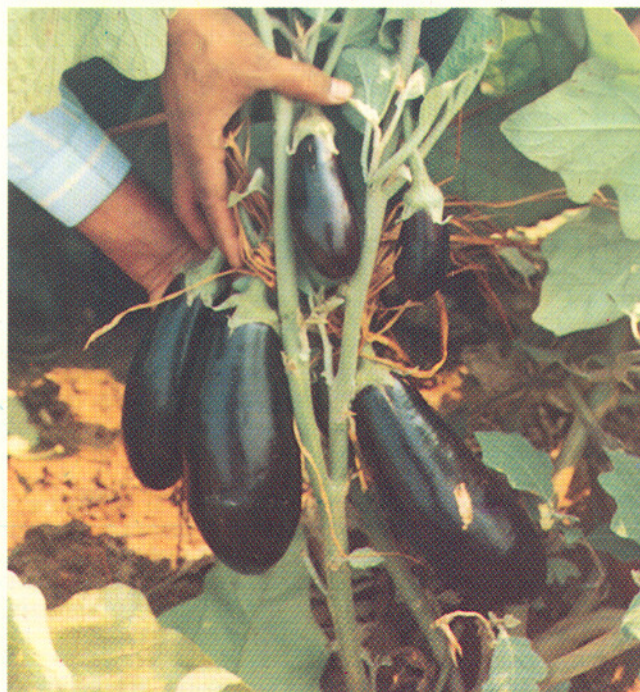
Demonstration

Field demonstrations of various aquaculture technologies are a regular Extension activity of CIFRI under the **Lab to Land Programme** and **Oilseeds & Pulses Project**, conducted for the benefit of fish farmers. During the first half of 1996, the Institute has organised 186 demonstrations on fish/prawn farming, integrated farming system, crop production, cultivation of betelvine, mushroom, brinjal, cabbage & cauliflower. The farmers were highly impressed by the yields obtained such as rice (42 q/ha), dry chilli (21 q/ha), water melon (800 q/ha), hybrid tomato (250 q/ha), betelvine (1.75 million leaves/ha), mushroom (225 g/sq.m), brinjal (37 q/ha), cabbage (39 q/ha) and cauliflower (250 / ha). Fish yields demonstrated 3000 kg/ha/yr for monoculture of fish and 1200 kg/ha/yr under brackishwater polyculture.

Training Programmes

A 10 day training course in *Prawn farming* was organised at Barrackpore during 6-16 June, 1996 for the benefit of 27 Extension Officers of the State Fisheries Department of West Bengal.

At the KVK, Kakdwip, 45 training courses were conducted on subjects ranging from Fisheries, Animal Science, Crop Science, Horticulture & Home Science, which were participated by 814 farmers, farm women and youth.



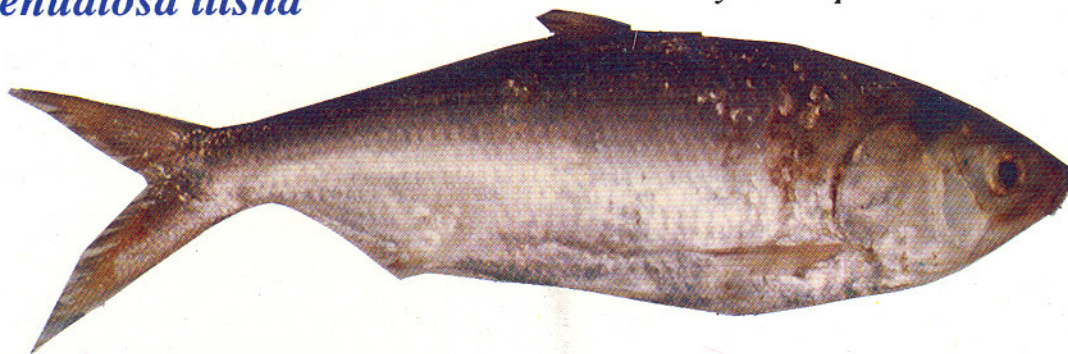
Top: Newly introduced improved variety of cauliflower

Middle: Pusa purple variety of brinjal raised under lab to land programme

Bottom: Improved variety of cabbage raised in farmers field

Know your fishes - 1

Tenualosa ilisha



Comparative palatability of fishes is often debatable. Yet, it can be stated that the Indian shad *Tenuosa ilisha* is a gourmet's dream on account of its unmatched taste. In Bengal, it is the choicest among fish delicacies and a pair of hilsa is offered to Goddess Durga on the Vijaya Dasami day. People in the eastern region adored this fish from time immemorial and they blended their folklore and legends with anecdotes about this fish. In ancient Sanskrit writings, hilsa is glorified as the *king of fishes* and its taste is said to surpass nectar.

There was a remarkable degree of understanding about the biology of this fish in olden days and so much so many customary modes have been in vogue to protect this fish from reckless exploitation. In the State of West Bengal, eating of hilsa is a taboo from October to January (when young ones abound) and thereafter it is ushered into the house as a ritual before restarting consumption. This abstinence is recommended as a prescription for health and prosperity - a covert conservation measure indeed.

Hilsa enjoys a very wide distribution in marine and freshwater gradients all along the Indian coasts. The migratory habits of hilsa make it a unique biological material capable of withstanding wide range of salinity and covering long distance against strong water currents. The lower regions of the estuary and the foreshore waters form the permanent habitats of hilsa. They migrate to the rivers for breeding. However, some riverine stocks in Ganga and Brahmaputra are believed to remain in freshwater areas throughout the year. In the Hooghly estuary, hilsa ascends upto about 298 km upstream during the two breeding seasons. In the rivers Mahanadi, Godavari, Krishna and Cauvery the extent of migration has been greatly restricted by the construction of anicuts and dams. Young ones return to their permanent habitats when they attain the size of 15 to 22 cm.

Hilsa is a plankton feeder. Diatoms and copepods form the main food of larvae. Young hilsa feed generally on diatoms and sparingly on copepods, cladocerans and ostracods. Older ones are found to feed on insects, chironomid larvae, etc. Females are larger than males. Depending on the size, females lay 2,50,000 to 16,00,000 eggs. Peak breeding season is monsoon (June-July to September) and there is a minor peak in winter (January-February). Going by the availability of young stages of hilsa, there is a view that breeding occurs throughout the year in Hooghly estuary.

Construction of Farakka barrage has greatly affected the migration of hilsa leading to the collapse of its fishery in the

middle stretches of the Ganga. Attempts are being made to artificially propagate this fish with a view to fostering recovery of the lost fishery.

Systematic position:

Order : Clupeiformes
Suborder : Clupeoidei
Family : Clupeidae
Subfamily : Clupeini
Genus : *Tenuosa*
Species : *Tenuosa ilisha*

Local names : Hilsa
(Hindi), Palasah
(Telugu), Oolum
(Tamil), Paliyah
(Malayalam), Pussai
(Oriya), Palla (Marathi), Ilish (Bengali, Oriya), Chaksi
(Narmada river), Ilihi (Assamese), Pulla (Sindhi). (Reproduced
from CIFRI Newsletter 4 1981)

Library

New Arrivals

Books

Reservoir Fisheries of India by Sugunan, V. V.

River Conservation and Management, by Boon, P. J., P. Caloae & G. E. Petts (Eds)

Recent advances in aquaculture Vol. 5 by Muir, James F & Ronald J. Roberts

Analysis of trace organics in the aquatic environment by Afghan, B. K. & Alfred S. Y. Chau

Theory of fish population dynamics as the biological background for rational exploitation and management of fishery resources by Nikolskii, G. V

Profiles in scientific research: Contributions of the Fellows Vol. 1 to 4 by Indian National Science Academy

Standard methods for examination of water and waste water 19th Edition by Franson, M A. (Ed.)

Freshwater invertebrates of the United States Protozoa to Mollusca 3rd Edition by Pennal, R. W

Assessment methodologies and management- Proc. of the World Fisheries Congress Theme 5 by Sakagawa, G. T.

Ecological and fisheries development in wetlands- A study of Chilka lagoon by Biswas K. P.

A symposium on fish culture: A practical guide on inland fish farming by Satyanarayana, V.

Water pollution management by Jivendra

Industrial environmental assessment and strategy by Aggarwak, S. K.

Water resource planning and development by Petersen, M.S

Staff News

Transfers

Dr. V.R. Desai, Principal Scientist	Bangalore to Hoshangabad on 11.4.96
Shri C. Selvaraj, Principal Scientist	Coimbatore to Bangalore on 11.4.96
Shri Karna Bahadur, SSG I	Barrackpore to Calcutta on 31.5.96
Shri N.K. Das, SSG I	Calcutta to Barrackpore on 31.5.96
Dr. M.K. Bandopadhyay, Se. Sr. Scale	CIFA to Barrackpore on 31.5.96

Promotions

From	To	w.e.f.
A.K. Chattopadhyay	T-7	T-8
Lalu Ram Mahaver	T-4	T-5
Sucheta Majumder	T-II-3	T-4
J.P. Misra	T-II-3	T-4
S.K. Chatterjee	T-II-3	T-4
T. Chatterjee	T-II-3	T-4
Sushil Kumar	T-II-3	T-4
C.K. Vava	T-II	T-I-3
Debasis Saha	T-1	T-2
S. Bandyopadhyay	T-1	T-2
Prahlad Singh	T-1	T-2
S.G. Biswas	T-1	T-2
Namita Choudhury	Assistant	Superintendent
Sandhya Majumder	Assistant	Superintendent
Kallu Singh	Sr. Clerk	Assistant
B.N. Sah	Sr. Clerk	Assistant
D.K. De Sarkar	Sr. Clerk	Assistant
D. Choudhury	Jr. Clerk	Sr. Clerk
S.K. Maranappan	Jr. Clerk	Sr. Clerk
Anjali Neogi	Jr. Clerk	Sr. Clerk
K. Majhi	Jr. Clerk	Sr. Clerk
K. Subrahmanyam	SSG I	SSG II

Advance increments	Grade	No. of increments	w.e.f.
Mira Sen	T-7	three	1.1.95
P.S.C Bose	T-5	one	1.7.94
K.K. Agarwal	T-5	three	1.7.94
R.C. Mandi	T-5	three	1.1.95
Sanjoy Bhowmik	T-5	three	1.1.95
S.K. S.S. Hameed	T-5	three	1.1.95
B.B. Das	T-II-3	two	1.1.95
Pintu Biswas	T-II-3	one	1.1.95
K.P. Singh	T-I-3	one	1.7.94
Chittaranjan Das	T-I-3	two	1.1.95
S.K. Deb	T-I-3	two	1.1.95
R.K. Halder	T-I-3	three	1.7.94
D. Chatterjee	T-2	one	1.1.95
R.K. Sah	T-1	two	1.1.95

Retirements

Dr. R. K. Banerjee, Senior Scientist (30. 9. 96),
Ch. G. K. Rao, T2 (31. 5. 96), Sri S. C. Balmiki
SSG III (30. 6. 96), Sri T. K. Biswas SSG III
(31. 5. 96)

Resignation

Sri Rajesh Khandelwal, Jr. Clerk resigned on 12. 4. 96.

Library

Assessment of water pollution by Misra, S. R.

Crisis in the world fisheries by Mcgoodwin

Handbook of ecotoxicology by Hoffman, D. J., A. R. Barnett, G. A. Burton & J. Carins

Condition of the world's aquatic habitats: Proceedings of the World Fisheries Congress, Theme 1 by Armantrout N. B.

Fish physiology Vol.1, 2, 6 & 7 by Hoar, W. S. & D. J. Randall

To be released soon

Fish and prawn disease diagnosis and control

Mans K. Das

&

R. K. Das

Published by

Inland Fisheries Society of India

Fish nutrition in aquaculture by Sena De Silva and T. A. Anderson

Small farm diversification: problems and prospects Workshop Proceedings I. By Haque, T (Ed)

Alp utpadan me atma nirbharta ka marg (in Hindi) by Indian Council of Agriculture Research

Journals

Abzceyan Monthly Magazine, 5 (5-6), 1994.

Advances in Biosciences, 14 (2), 1995.

Amazoniana, 13 (3-4), 1995.

American Museum Novitates, No.3160, 1996.

Annual Review of Fish Diseases, 5, 1995.

Aquaculture, 135 (1), 1995 to 139 (1-2), 1996.

Aquaculture News No. 20 Nov., 1995.

Aquafarm News, 23 (1-2,4-6), 1995.

Asian Aquaculture, 17(2-4), 1995, 18 (1), 1996.

Asian Fisheries (Science) Society, 8 (2/3), 1995.

Bay of Bengal News, 11 (2), 1996.

Bay of Bengal Programme (BOBP/REP), BOBP REP

70/71, 1995-96.

Bhagirath, 42 (2-4), 1995.

Bigyan 81 (6-7), 1995.

Bulletin CMFRI, 36, 45-48.

Current Science, 70 (8-12), 1996.

Down to Earth 4 (9-24), 1996.

Ecology of Freshwater Fish, 4 (2-4), 1995.

Environment, Jan., April, 1996.

- Environment and Ecology*, **13** (4), 1995; **14** (1-2), 1996.
Environmental Biology of Fishes, **44** (1-4), 1995.
Environmental Conservation, **22** (2-4), 1995.
Environmental Pollution (Series A) **91** (1-3), 1996.
Estuaries **18** (3-4), 1995; **19** (1), 1996.
Fishing Chimes, **15** (8-12), 1995; **16** (1-2), 1996.
Fisheries World, **3** (1-7), 1995-96.
Himalayan J. Environment & Zoology, **8**(1), 1994.
Hydrobiologia, **310-316**, 1995.
Hydrobiological Journal, **31** (3-6), 1995.
Indian Farming, **45** (1-3, 5-10), 1996.
Indian J. of Agricultural Economics, **50** (4), 1995.
Indian J. of Animal Sciences, **65** (12), 1995.
Indian J. of Biochemistry & Biophysics, **32** (6) 1995; **33** (1-3), 1996.
Indian J. of Experimental Biology, **33** (11-12), 1995; **34** (1-5), 1996.
Indian J. of Fisheries, **39** (3-4), 1992; **40**(4), 1993; **41**(1), 1994.
Indian J. of Marine Science, **24** (4), 1995; **25** (1-2), 1996.
Indonesian Agr. Res. & Dev. Journal, **16** (3-4), 1994.
Invention Intelligence, **30** (11-12), 1995; **31** (1-5), 1996.
Journal of the Alabama Academy of Science **66** (1-4) 1995
Journal of the Aquaculture in the Tropics, **10** (4), 1995; **11** (1), 1996
Journal of Aquatic Animal Health, **7** (3-4) 1995
Journal of Aquatic Biology and Fisheries **1** (2) 1994.
Fisheries Research Inst., Bangladesh, **4** (1) 1996.
North American Journal of Fisheries Management, **15** (4) 1995.
Journal of Biosciences **20** (5) 1995, **21** (1-2) 1996
Journal of Environmental Biology **16** (4) 1995, **17** (1-2) 1996.
Journal of Environment and Pollution **2** (4) 1995, **3** (1) 1996.
J. of Faculty of Applied Biol. Sci., Hiroshima Univ., Japan **34** (1-2) 1995.
Journal of Fish Biology **47** (5) 1995.
Journal of Fish Disease **18** (6) 1995.
Journal of Freshwater Biology **6** (4) 1994, **7** (1-3) 1995.
Journal of Ichthyology **35** (9) 1995.
Japanese Journal of Medical Science & Biology **48** (1,3-4) 1995.
Journal of Shimonoseki Univ. Of Fisheries **43** (1-4) 1995.
Kheti, **49** (1-12) 1995.
Kisan, **1-4** 1996.
Kurukshetra, **43** (7-10) 1995.
Limnology & Oceanography, **40** (6-7) 1995.
Mahasagar, **27** (2) 1994
National Geographic, **188** (4-6) 1995.
Nature **6546-6556**, 1995.
Newsletters
Indian Council of Agriculture Re. News, **1** (3-4) 1995, **2** (1) 1996
SAARC Agricultural Information Centre **5** (1-2) 1995.
SEAFDEC, **18** (2-3) 1995.
NACA, **12** (4) 1995, **13** (1) 1996.
Proc. of the Indian National Science Academy, **61** (5-6) 1995.
Proceedings of the Indian Science Congress Association, **82** (1-4) 1995.
Pollution Research, **14** (3-4) 1995.
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From the 'Editors' Desk.....

In the scientific literature in India, the expression *Inland Fisheries* is often used in common parlance to embrace a variety of fisheries-related activities including freshwater aquaculture, capture fisheries and enhancement in the inland water bodies. However, by the increased use of terminologies like aquaculture, freshwater aquaculture, coastal aquaculture, mariculture, etc. in recent years, the connotation of inland fisheries has undergone a change. Now, inland fisheries refers distinctly to the capture or culture-based fisheries of the open waters, as opposed to freshwater aquaculture which is the culture of fish and other organisms in small ponds. Notwithstanding some of the overlapping that still persists while dealing with the areas like extensive aquaculture in reservoirs, it can be easily seen that the terms aquaculture and fisheries have emerged as separate concepts with distinct conceptual clarity. This has been reflected in the Documentation followed by international and intergovernmental agencies across the world.

Our endeavour is to follow this nomenclature and encourage its use by others in order to avoid semantic confusion in our scientific reporting. It is mainly in this background that we have rechristened the CIFRI Newsletter as *Inland Fisheries News*. The inaugural issue of *Inland Fisheries News*, the newsletter of Central Inland Capture Fisheries Research Institute, Barrackpore is in your hand, as a successor to the CIFRI Newsletter, the publication of which was discontinued after May 1990. This is envisaged as an effective link between CIFRI on the one hand and the researchers, teachers, students, fishery managers, and entrepreneurs on the other. It is our endeavour to include many informative articles, apart from the research findings.

We welcome your valuable suggestions for improving the content and presentation of this journal.

Dr. V. V. Sugunan & Dr. M. K. Das
Editors